

CSTR40-12

1. General Description

The CST40-12 and CSR40-12 are matched pair ultrasonic transmitter and receiver respectively operated at 40kHz center frequency with $\varnothing 12.6\text{mm}$ diameter in metal case. This transducer utilizes the piezoelectric properties of engineering ceramic that provides high sound pressure and high sensitivity.

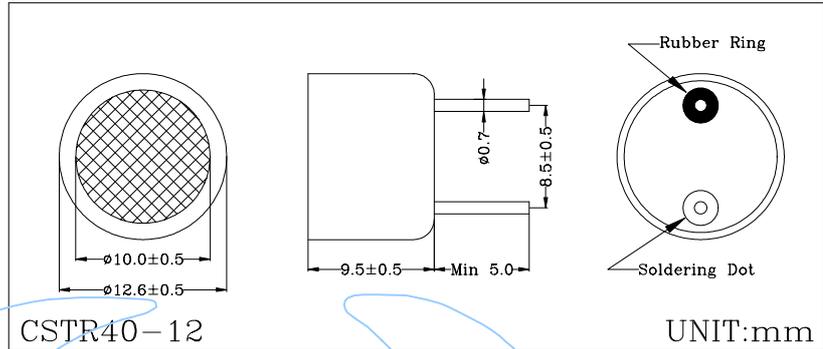
2. Features

- High sound pressure
- High sensitivity
- Air medium
- Metal housing

3. Applications

- ▣ Auto switching
- ▣ Car obstacle avoidance
- ▣ Range finder
- ▣ Fluid level control
- ▣ Burglar alarm

Dimensions



4. Absolute Maximum Ratings

($T_a=25^\circ\text{C}$)

Parameter	Symbol	Ratings	Unit
Maximum Input Voltage	V_{MAX}	12	Vrms
Shock Impact	Si	50	G
Operating Relative Humidity *1	RHopr	10 ~ 90	%
Operating Temperature	Topr	-30 ~ +80	$^\circ\text{C}$
Storage Temperature *2	Tstg	-40 ~ +90	$^\circ\text{C}$
Soldering Temperature *3	Tsol	240	$^\circ\text{C}$

*1 - Ambient temperature $T_a = 25^\circ\text{C}$.

*2 - Within 24 hours.

*3 - At the position of 2mm from the bottom face within 5 second.

5. Electro-Sonic Characteristics

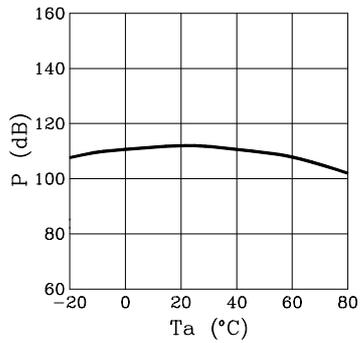
($T_a=25^\circ\text{C}$)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit	
Transmitter CST40-12	Center Frequency	f_c	Still Air			40.0 ± 1.0	kHz
	Sound Pressure Level *4	P	$f=40\text{kHz}$, $V_i=10\text{Vrms}$			112	dB
	Attenuation of Sound Pressure Level	ΔP	$T=-30^\circ\text{C} \sim +80^\circ\text{C}$, $\text{RH}=30\%$			-10	dB
	Bandwidth	$\Delta \lambda$	$P=100\text{dB}$, $f=40\text{kHz}$			5.0	kHz
Receiver CSR40-12	Center Frequency	f_c	Still Air			40.0 ± 1.0	kHz
	Sensitivity	S	$f=40\text{kHz}$			-67	dB/V/ μbar
	-6dB Directivity	$\theta_{-6\text{dB}}$	$f=40\text{kHz}$			80	deg.
	Bandwidth	$\Delta \lambda$	$f=40\text{kHz}$			5.0	kHz
	Capacitance	Cs				2700	pF

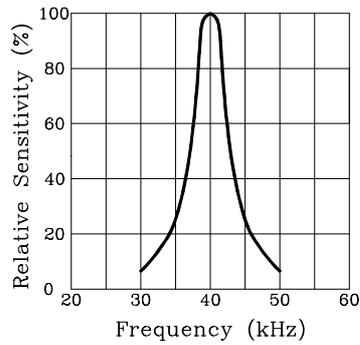
*4 - 0dB = 0.0002 μbar (1 atm = 1.01325 bar)

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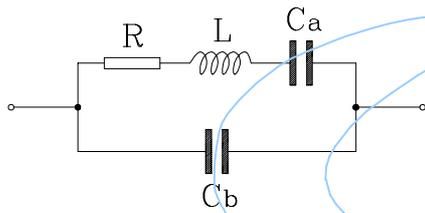
Sound Pressure Level vs Ambient Temperature



Relative Sensitivity vs Frequency



Equivalent Circuit



Directivity Diagram

